DTIC Current Awareness: March 2003

Bates, M. J. (2002). *A Risk Factor Model Predicting the Relationship Between Stress and Performance in Explosive Ordnance Disposal (EOD) Training.* Bethesda, MD: Uniformed Services University of the Health Sciences. (DTIC No. ADA410705)

http://handle.dtic.mil/100.2/ADA410705

Abstract: Stress is a common aspect of military operations. It therefore follows that training to work effectively under conditions of stress is an essential component of military training programs. The primary purpose of this proposed study is to identify specific risk and protective factors that predict the effects of stress responding on military operational performance. Because of the high levels of stress and resultant program attrition, the military's Explosive Ordnance Disposal (EOD) training program provides a unique opportunity to study the interaction between stress and performance, and to identify specific risk and protective factors. The study recruited 500 students who were enrolled in EOD training. These students were enlisted personnel in the US military who volunteered to participate in the study at two points during the training program. Self-report assessments of potential risk factors were collected at the beginning of the training program and at one intermediate time point that is associated with the highest level of student attrition. These risk factors included general cognitive ability, inattention and impulsivity, problem solving, anxiety, personality dimensions, social relations, and stressful events. In addition, the study explored the role of the demographic, social desirability, and external stressor control variables. The risk factors and control variables were used to predict two measures of performance. The first measure of performance was the grade on the first practical test of the training program, a continuous outcome between 0-100. The second performance measure was program completion, which was a dichotomous outcome of successful or unsuccessful completion.

Doane, S. and Bradshaw, G. (2003). *Integrating Digital Eye Tracking With Personnel Optimization Research.* Mississippi State, MS: Mississippi State Department of Psychology. (DTIC No. ADA411009)

http://handle.dtic.mil/100.2/ADA411009

Abstract: This award funded the purchase of a Digital Eye Tracking Research System (DETRS). The DETRS is a state-of- the-art system that allows cognitive scientists at Mississippi State University to integrate eye movement capture into their personnel optimization research. The DETRS enables integration of video and eye tracking data by capturing video data in a digital format, and allows access to several aspects of the same performance, such as pupil measures and

point of gaze, and the ability to cross reference data from multiple subjects simultaneously. It includes high precision eye tracking instruments and components that enable the analysis and interpretation of the massive data sets. The non-linear digital data allows the selection of particular frames or crucial moments and this enables focused analysis and display of the data of interest. The DETRS is configured to maintain portability for field experiments and still provide the data storage and processing capacity necessary for archiving, editing and analyzing data. All equipment has been purchased, is in use, and is augmenting the research of multiple DoD and NSF grants.

King, D. R. (2002). Predicting Post-Acquisition Performance: Focusing on High-Technology Target Firms (Report No. CI02-840). Wright-Patterson AFB, OH: Air Force Institute of Technology. (DTIC No. ADA410775)

http://handle.dtic.mil/100.2/ADA410775

Abstract: Merger and acquisition (M&A) activity represents a major force in the global business environment, whether measured by the number or the value of deals. Even though existing research finds acquisitions, on average, do not improve firm performance, the dominant explanation for why firms pursue acquisitions is that they seek increased performance. There is a recognized need to model post-acquisition performance to help distinguish between acquisitions that will fail and those that will succeed. By addressing methodological shortcomings in existing post-acquisition performance research, the present research develops a model for predicting when acquisitions of high-technology targets result in improved performance. Implications for both theory and managerial practice are identified.

Throne, M. H. and Burnside, B. L. (2002). *Integrated Training and Performance Support for the Objective Force (Report No. ARI-1801).* Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences. (DTIC No. ADA410554)

http://handle.dtic.mil/100.2/ADA410554

Abstract: The U.S. Army has begun transformation to an Objective Force operating within joint, interagency, and multinational environments. This transformation will require changes in training, with more of a reliance on embedded training and electronic performance support system (EPSS) capabilities, in order for units to be responsive, deployable, agile, versatile, lethal, survivable, and sustainable. This report reviews Objective Force training needs and applies an existing method for analyzing the appropriateness of alternative methods for meeting these needs. This initial analysis indicates that for the overall system of systems

level, fully or appended embedded training is recommended. At the task level, embedded training is appropriate to varying degrees, depending on a number of considerations. Information on the performance of all tasks should be embedded, but practice of task performance with feedback should only be embedded where safe, reasonable, and cost-effective. This report also includes a brief summary of the embedded training and EPSS literature, leading to derivation of a set of usage considerations and design guidelines for developing effective embedded training and EPSS capabilities.

Yang, N. F., Jin, D. W., Zhang, M., Huang, C. H. and Wang, R. C. (2001). *An Extending Fitts' Law for Human Upper Limb Performance Evaluation.* Beijing, China: Tsinghua University, Department of Precision Instruments. (DTIC No. ADA411082)

http://handle.dtic.mil/100.2/ADA411082

Abstract: Human motor behavior is complex and is challenging to understand. Fitts' Law presented a relationship between speed, accuracy, amplitude of movement and target size in upper extremity tasks. In this paper, Fitts' Law was extended from one- dimensional motion to two-dimensional motion in the polar coordinate system for the human upper limb performance. Based on this, a set of indices were proposed. The index of difficulty and the index of performance were introduced as the general indices St for the quality measure of plane pointing movement, which is a basic functional action of upper-limb in human daily life. Five healthy subjects were asked to perform six pointing tasks with different indices of difficulty. All movements were recorded using a motion analysis system. The movement quality was evaluated using these evaluation indices.